On a new Species of *Xenophthalmus* White, (Crustacea; Brachyura, Pinnotheridae) from Cochin[1]

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(*With a plate and six text-figures*)

The paper describes a new species of the genus *Xenophthalmus* White, *X. garthii* and compares it with the other two known species, *X. pinnotheroides* White and *X. obscurus* Henderson.

INTRODUCTION

The five specimens, on which the new species is based, were collected in 1965 and 1966 from Ponjikkara Island on the Cochin backwaters. Dr. John S. Garth of Allan Hancock Foundation, California, had collected a male of this species from the same locality in 1964 (Pers. comm.). The new species, unlike other members of the genus is an estuarine form. The salinity of its habitat varies considerably as a result of the monsoon. The observed range of salinity at the time of collection of these specimens was 13·08‰ to 29·75‰. The substratum at the place of collection consisted of silt and clay.

Xenophthalmus garthii sp. nov.

(Pl. I, Figs. 1-6)

Material: Holotype: a berried female; Reg. No. ZSI $\frac{C5979}{1}$; locality Ponjikkara Island (about 100 metres east of jetty), Cochin backwaters; collected on 17 November 1965. Allotype: Reg. No. ZSI

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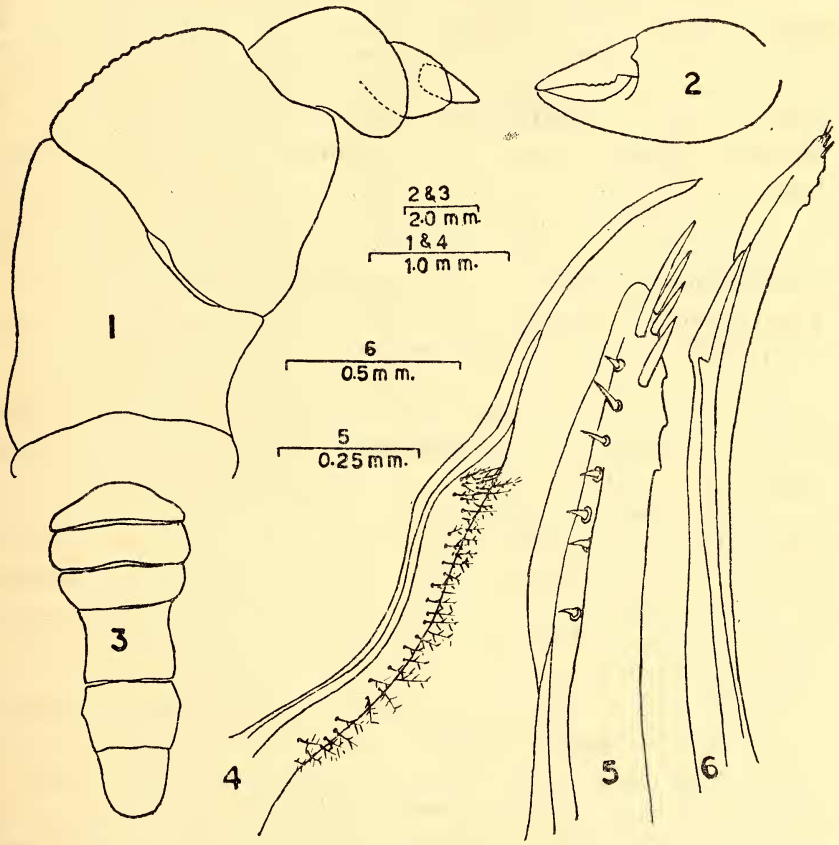
$\frac{C5980}{1}$; locality same as that of holotype; collected on 5 July 1966.

Paratypes: 3 females (one berried); Reg. No. ZSI $\frac{C\ 5981}{1}$; locality same as that of holotype; collected in November 1965.

The type specimens are deposited with the Zoological Survey of India.

Description: Carapace broader than long; flat across intestinal and branchial regions, prominently convex fore and aft and nearly flat laterally; smooth across intestinal and branchial regions, pitted in one specimen on the lateral margin of cardiac region, and across cardiac,



Figs. 1-6. *Xenophthalmus garthii* sp. nov. 1. External maxilliped. 2. Male chela. 3. Male abdomen. 4, 5 & 6. First male pleopod.

urogastric and branchial regions in others; granulated prominently as a triangular patch close to lateral margin in the branchial region in one, granulation feeble or nearly absent in others; minutely pubescent in the anterior half, pubescent and minutely granulated in the pterygostomian region; pubescence in male more conspicuous; an oblique ridge, fairly

well recognisable in some or nearly absent in others, starting from the tip of the orbit and joining the first cleft of the lateral margin of carapace ; another ridge on the anterior border of urogastric region curving backwards along its antero-lateral border then traversing across and terminating on an elevated granule a little away from the lateral margin ; a conspicuous dot-like depression just anterior to this ridge midway between outer margin of gastric region and lateral margin of carapace ; in one specimen the transverse ridge is replaced by a pair of short oblique ridges on the posterior border of cardiac region with an additional outer pair located slightly in advance of the inner pair ; regions rather well marked, gastric region antero-laterally marked by depression, urogastric region demarcated as a depressed area, cardiac region marked laterally by deep furrows, in the holotype and allotype furrows demarcating cardiac and urogastric regions of nearly uniform thickness and in the form of deep ' H ' with the anterior arms of ' H ' slightly incurved ; intestinal region delineated on the lateral sides by faint lines. Antero-lateral margins smoothly rounded, lateral margin granulated and with two clefts forming a small semi-circular lobe in between these clefts ; a granulated tooth-like projection a little ahead of postero-lateral angle ; posterior border broad, carinated throughout and concave in the middle ; sub-branchial region puffed out visible dorsally beyond lateral margin and provided with an obliquely vertical faint granulated ridge.

Front not projecting to the extent of the anterior border of buccal cavern and standing on a higher plane than the hepatic region on either side ; anterior border nearly straight and corners rounded, lateral borders almost straight. Orbit placed obliquely as a slit on the surface of carapace ; tip narrow and pointing outwards ; a small tooth at the base of the orbit and not touching the front on the inner side almost closing the orbit. Antenna standing at the opening of the orbit ; peduncle of three segments, first thick and short, second longest and slender and third smallest ; flagellum of about six segments, segmentation of flagellum indistinct in certain cases. External maxillipeds not completely closing the buccal cavern, its outer border uniformly rounded ; exopod hidden by endopod and not reaching the distal end of merus, flagellum thin and concealed ; ischium with flattened lobe at its proximal end provided with feathery setae, longer ones distally ; propodus also flattened and almost circular attached about the middle of carpus, its distal end fringed with feathery setae ; dactylus short, thick and finger-like attached on the upper side a little away from the tip of propodus.

Chelipeds slender and shorter than walking legs in females ; upper and lower margins of merus unarmed but provided with fringes of bristles ; upper surface of carpus with two, and outer surface with a single longitudinal row of bristles ; palm shorter than fingers, its upper surface with two longitudinal rows of bristles, outer more dorsal and smaller,

inner longer and pointing inwards ; outer surface close to ventral border with a sharp carina carrying a fringe of bristles extending from the proximal end to the tip of fixed finger ; dactylus with three longitudinal fringes of bristles on the dorsal surface ; fixed finger with a fringe of bristles on the inner side of cutting edge. Chelipeds in male dissimilar and much larger than walking legs ; segments unarmed and smooth ; merus pubescent along anterior and posterior border and with a tuft of bristles at the distal end on the outer side. Carpus of smaller cheliped with three fringes of hairs—two upper and one lower of which inner upper row more conspicuous. Propodus in larger chela expanded, about as high as long on the upper surface and a little higher than the length of movable finger ; flattened laterally, broader near the tip and narrowing uniformly to the tip of finger. Chela bent inwards towards the tip forming an arch ; fingers pointed and meeting only at the middle leaving a wide gap at their base, the gap being wider in the larger chela ; movable finger with an enlarged tooth near the base on the cutting edge, more conspicuous on larger chela, and with two rows of bristles on the upper surface ; fixed finger with a single row on the inner side (in addition to the fringe borne on the carina).

Fourth leg thin and shortest, third longest and as stout as second and first, first shorter than second. Postero-ventral margin of merus of first three legs armed with a row of spines of uniform size; its upper border in first three legs uniformly granulated and pubescent in the first leg. Pubescence reduced in the second and absent in the third, and fairly well developed in the fourth. Posterior surface of carpus in the first leg with a fringe of bristles, and in the second and third with a patch of woolly hairs. Propodus of first leg twisted but normal in other legs; its dorsal surface of proximal end expanded laterally ; distal end progressively twisted and narrower, the movement of propodus oblique ; in the twisted position propodus having three rows of bristles anteriorly, lowermost being most prominent and posterior border with a single row in addition a short distal fringe. Dactylus flattened laterally, dagger-shaped and fringed with bristles, tip pointing upwards. Upper and lower borders of propodus and both borders of dagger-shaped dactylus of fourth leg also fringed with bristles.

Abdomen of seven separate segments. In the male first four segments broadest, third segment with convex borders, fourth segment narrowing distally, fifth segment with a constriction near the base and widening distally, sixth segment broadest a little proximal to the middle of the segment. End segment very nearly as long as broad and with convex tip.

First male pleopod sinuous in shape, enlarged at about the middle, inner margin and upper surface with a number of branched hairs, not extending beyond the enlarged part ; under high magnification four subterminal thick short setae on the inner side.

Measurements in mm.

	Holotype	Allotype	Paratypes		
Length of front	1·00	0·86	0·86	0·86	0·81
Width of front	2·11	2·00	2·10	1·86	1·71
Length of carapace (from base of orbit to posterior border)	9·00	9·14	9·00	9·00	8·14
Width of carapace (between projections at postero-lateral angles)	12·71	12·14	12·28	12·57	10·14
Length of propodus of first walking leg	2·00	—	2·14	2·14	1·85
Height of propodus of first walking leg	1·57	—	1·71	1·57	1·28

Discussion

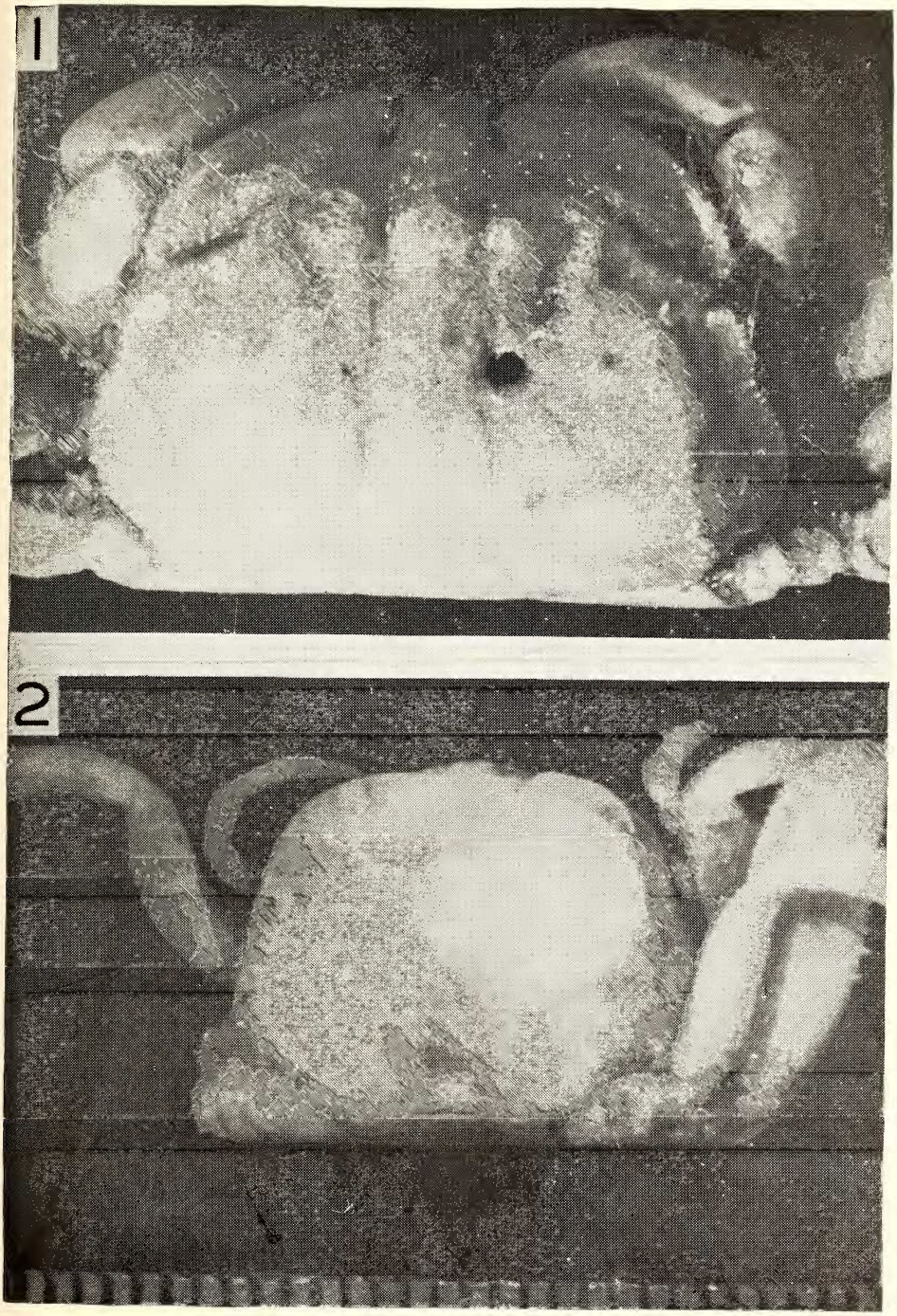
Xenophthalmus White is a rare genus containing three species, *X. pinnotheroides* White, *X. obscurus* Henderson and *X. garthii* sp. nov. *X. pinnotheroides* is found from the east coast of India (Henderson 1893 and Sankarankutty 1965) to Japan (Sakai 1955). *X. obscurus* is so far known only from the Indian Ocean (Alcock 1900).

Affinities : X. garthii differs from *X. pinnotheroides* and *X. obscurus* in : (1) presence of two clefts on the lateral margin of carapace resulting in the formation of a small lobe in between and (2) presence of a small granulated projection a little ahead of postero-lateral angle of carapace.

It resembles *X. obscurus* in the oblique orbit and longer propodus of first leg. The following important differences were noticed on comparison with a female specimen of *X. obscurus* from the Indian Museum (No. 1025/7 ; Port Blair, Andamans) : (1) carapace almost devoid of pubescence ; (2) merus of external maxilliped narrowing prominently towards the distal end ; (3) branchial region minutely granulated ; and (4) armature on the ventral border of merus of walking legs (except on fourth) in the form of strong widely spaced curved hook-like spines, often with smaller ones in between.

Apart from the presence of lateral lobe of carapace, presence of projection on postero-lateral margin of carapace, oblique nature of orbit and longer propodus of first walking leg, it differs from *X. pinnotheroides*, in : (1) almost complete absence of pubescence on the longitudinal furrow of external maxilliped, (2) flattened and almost circular propodus of external maxilliped and, (3) uniform size of armature on the ventro-posterior border of merus of first three walking legs.

Dr. John S. Garth on comparing the male specimen with him (Allan Hancock Foundation) with the holotype of *X. obscurus* (female ;



1. *Xenophthalmus pinnotheroides* White. Male syntype, British Museum No. 43.6, locality Philippine Islands.
2. *X. obscurus* Henderson. Female holotype, British Museum No. 88.34, locality Martaban.

Martaban ; E. W. Gates Col. Reg. No. 88.34) and cotypes of *X. pinnotheroides* (A male and two females ; Philippine Islands ; H. Cuming Col. Reg. No. 43.6) in the British Museum noted the following additional differences (Pers. Comm.): ' The Cochin specimen disagrees with *X. pinnotheroides* White, in having a short front, that of *pinnotheroides* being noticeably more advanced. The milled line extending from the orbit to the antero-lateral angle has no counterpart in *pinnotheroides*, but the lobe at the lateral angle is represented in *pinnotheroides* by a cluster of granules. There is no transverse dorsal ridge in *pinnotheroides* but its posterior border is long and straight like that of the Cochin specimen. Most remarkably, in *pinnotheroides* the carpus and propodus of the first walking legs are greatly broadened, giving this member a shovel-like appearance. In the Cochin specimen the hairs on the third walking legs are short and woolly, whereas on *pinnotheroides* they are long and silken. The external maxilliped has its propodus flattened in the Cochin specimen as you have noted ; in *pinnotheroides* it is deeply grooved but I did not see pubescence.

The Cochin specimen disagrees with *X. obscurus* Henderson in having a less advanced front. The ridge across the carapace bends forward in the Cochin specimen to pass forward of the cardiac region, while in *obscurus* it bends backward to pass behind the cardiac region. Also, while in the Cochin specimen the posterior margin is straight for the full width of the carapace, in *obscurus* it bends forward laterally above the coxa of the fourth walking legs. The propodus of the external maxilliped is broader anteriorly in Cochin specimen but not deeply grooved in either. The armature of the posterior border of the merus of the walking leg is spinulous in *obscurus*.

I did not examine pleopods because *X. obscurus* is represented only by the female and the types of *X. pinnotheroides*, while in good condition, have been relaxed from the dried collection. There is, however, a good difference in the shape of the male abdomen, that of Cochin specimen having both the broadest somite and next distal to it laterally rounded, while in *pinnotheroides* only the broadest (3rd ?) is rounded, the next distal having the margins straight and converging.

Only in *pinnotheroides* are the orbits true ' button-holes ' (closed both top and bottom).'

KEY TO THE IDENTIFICATION OF THE SPECIES OF *Xenophthalmus*

1.	Lateral margin of carapace with two clefts forming a lobe in between ; presence of a small tooth-like projection a little ahead of the postero-lateral angle of carapace ..	*X. garthii*
	Lateral margin of carapace with a single cleft, no tooth-like projection at the postero-lateral angle of carapace ..	2
2.	Orbits almost parallel to each other ; propodus of first walking leg as long as broad	*X. pinnotheroides*
	Orbits oblique ; propodus of walking leg longer than broad	*X. obscurus*

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References

Alcock, A. (1900): Materials for a Carcinological fauna of India. No. 6. The Brachyura Catometopa or Grapsoidea. *J. Asiat. Soc. Bengal* **69**: 279-456.

Henderson, J. R. (1893): A contribution to Indian Carcinology. *Trans. Linn. Soc. London (Zool.)* **5**: 325-406.

Sakai, T. (1955): On some rare species of crabs from Japan. *Bull. Biogeo. Soc. Japan*, **16019**: 106-113.

Sankarankutty, C. (1965): On Decapoda Brachyura from the Gulf of Mannar and Palk Bay. Symposium on Crustacea. Marine Biological Association of India, Part I: 347-363.